Heather L. Barnes. An Investigation into the Personal Archiving Strategies of Independent Documentary Filmmakers. A Master's paper for the M.S. in L.S. degree. July, 2008. 48 pages. Advisor: Deborah Barreau

The shift to digital production methods for moviemaking has resulted in a proliferation of digital moving image elements, requiring a different set of preservation practices than are used for analog film. The longevity of these works may be uncertain. Little is known about how independent filmmakers organize and maintain their digital production files. Other studies of personal archiving practices have found that individuals lack the necessary knowledge and resources to preserve their digital files.

This study explores the personal archiving strategies of independent documentary filmmakers in order to gauge their knowledge of and interest in preservation of their digital collections. Via semi-structured interviews and field observation, data analysis focuses on how independent documentary filmmakers organize and maintain their digital moving image files. Results address implications for preservation of respondents' materials and for archivists and digital curators working with digital cultural heritage materials.

Headings:

Audiovisual materials
Digital preservation
Personal information management

AN INVESTIGATION INTO THE PERSONAL ARCHIVING STRATEGIES OF INDEPENDENT DOCUMENTARY FILMMAKERS

by
Heather L. Barnes

A Master's paper submitted to the faculty
of the School of Information and Library Science
of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements
for the degree of Master of Science in
Library Science.

Chapel Hill, North Carolina

July, 2008

Approved by:

_____

Advisor

Table of Contents

INTRODUCTION

In the shift to digital video production methods, new issues have emerged that affect the practice of moving image preservation. As more filmmakers work exclusively with digital materials, film archives must integrate and manage a range of file formats, software, and hardware. Howard Besser (2001) notes, “Information encoded and stored in digital form is fragile, but in very different ways than film stock.” Likewise, Karen Gracy (2004) explains the importance of an increased awareness of the digital preservation conundrum:

> If the lack of standards for video preservation makes conservation-minded information professionals uneasy, the state of digital preservation is likely to incite a full-fledged panic. NO longer are we merely coping with the chemical instability of the recording media; the obsolescence of the recording formats takes precedence as the new preservation challenge. And in the last twenty years, we have seen a staggering array of digital formats - with more being developed on what seems like a weekly basis. (p. 50)

Lyman and Varian (1997) estimated that over one billion home video tapes were produced yearly during that decade. Michael Lesk (1997) writes that, of the vast amount of information produced, “Only a tiny fraction of this information has been professionally approved, and only a tiny fraction of it will be remembered by anyone.” Don Waters and John Garrett (1996), in *The Preservation of Digital Information*, argue that the "first line of defense against loss of valuable digital information rests with the creators, producers, and owners of that information." If that is so, then it may be useful to survey the data management and personal archiving practices of these content creators.

In *The Paradox of Digital Preservation*, Su-Shing Chen (2001) notes the urgency of preserving digital information. He argues, "Failing to address the problems of preserving digital information is analogous to fostering cultural and intellectual poverty" (p. 2). In contrast to traditional preservation, however, curators responsible for digital data cannot indefinitely maintain the information in its original state. Chen notes the paradox that this creates: "On the one hand, we want to maintain digital information intact as it was created; on the other, we want to access this information dynamically and with the most advanced tools" (p.3).

Whereas film archives have developed relatively consistent and reliable methods for working with analog film, the field of digital preservation is still developing common standards. Digital preservation strategies such as migration, emulation, and refreshing have been adopted. Some of the primary issues involved in digital audiovisual preservation include choice of materials (hardware, software, and file formats), compression and decompression techniques, description and discovery tools (i.e. metadata), and long-term access. There have been attempts to map some of the challenges involved in audiovisual preservation. In their report, *Digital Video Archives: Managing Through Metadata*, Howard D. Wactlar and Michael G. Christel (2002) of Carnegie Mellon University outline several key questions for digital media archivists:

> What should the sampling and quantization rates be? What compression strategies should be used—lossy or lossless? What media should be used to store the resulting digital files—optical (such as digital video disc [DVD]) or magnetic? What is the shelf life for such media, i.e., how often should the digital records be transferred to new media? What are the environmental factors for long-term media storage? What decompression software needs to exist for subsequent extraction of video recordings?

Likewise, the JISC *Digital Moving Images and Sound Archiving Study* (2006) calls

preservation of moving images one of the most challenging problems facing the profession. The study depicts some of the core differences between digital and analog preservation:

> Management and preservation requirements for digital materials are fundamentally different from those of analogue materials. Digital materials can be created using a wide range of technologies and formats, whether these are born digital or are digital surrogates of existing analogue materials. They are described and documented in a variety of ways, while some are not documented at all. They are subject to both physical deterioration and technical obsolescence. More than one copy can be easily and simply created. Access may be provided through more than one point, and may be distributed. All these factors will impinge upon the approach taken to their management and long-term preservation.

The work of independent documentary filmmakers exists in a space between personal and corporate; their projects are often small in scale. Without formal studio sponsorship, they often retain control over the physical and intellectual assets of their films. Outside of large, studio-sponsored projects, independent documentary filmmakers typically work with small budgets, often funding their projects out of their own pockets and/or garnering support via friends, relatives, and small foundation grants. They may work in crews of just a few people or alone, and find distribution for their films via film festivals, local screenings, or the Internet. Many of these small-scale documentaries will never find permanent homes in archives. If information professionals are interested in the long-term prospects of contemporary cultural heritage materials, it may be necessary to question how these materials will fare in the custody of the artists and creators themselves. When the Folkstreams project began soliciting older films (1980s and earlier) from documentary filmmakers for its 16mm film digitization project (the results of which can be seen at the Folkstreams website, http://www.folkstreams.net), for example, they found some film components decaying in the basements and barns of the filmmakers.

Analog film materials are subject to decay and neglect; it is likely that digital filmmakers' materials face similar if not more urgent risks.

Personal information management is an area of study within information science that examines how individuals cope with the large amounts of information with which they interact on a daily basis. Few studies in this area have examined the personal archiving practices of digital artists, and none were located that specifically investigate the practices of digital filmmakers. Examining these artists' data management practices may provide useful information about how some of these digital cultural heritage materials will fare in the long term.

The relationship between how filmmakers currently manage their digital files and the long-term preservation of those files requires an analysis drawing on concepts from the fields of both personal information management and digital preservation. Few studies have investigated that relationship. If the results of empirical research into the personal information management practices of other groups can be generalized to creators of digital video, the long-term sustainability of these films is likely to be complicated by the filmmakers' file management and personal archiving practices. In addition, an investigation into the information management practices of digital filmmakers would document not only specific habits and filing strategies, but attitudes and perceptions behind their practices. It seems relevant to determine whether or not documentary filmmakers, whose work exists somewhere between personal and commercial productions, feel a sense of urgency to preserve their digital materials. In combination with their actual practices, the filmmakers' stated values and intentions could shed light on possible risks to this body of creative materials.

LITERATURE REVIEW

Although no published studies relate to the personal information management (PIM) strategies of independent filmmakers, the body of literature on PIM gives an indication of how such a study might be structured, and provides some key concepts and frameworks for analyzing results. Beagrie (2005) looked at the effects of trends in networked computing. In the last few decades, he notes, increased storage and accessibility of productive software has enabled more people to "create, capture and store an ever-increasing amount of digital information about, or for, themselves." He argues that active curation will help protect personal digital libraries, but that more research into these types of collections is necessary.

The concept of digital estates may provide a useful framework for analyzing individual filmmakers' collections. Studies (Kaye 2006, Marshall 2006) indicate that people tend to neglect their digital objects. A key difference between digital and analog collections is that digital materials "require continuous management, and for [their] long-term preservation, intervention at or close to the point of creation" (Beagrie 2005). In other words, waiting until a person is deceased to appraise his or her papers may be an ineffective strategy for digital files. Beagrie contends that "digital systems should ultimately support digital memory." Data resulting from a study of documentary filmmakers should include, then, some discussion of whether services for archiving digital video files might be useful in assisting filmmakers with the problems of self-archiving their work.

In support of the concept of early intervention, Thomas and Martin (2006) document the PARADIGM project, an archives-led effort to collect and preserve active

politicians' personal digital archives. The authors note that the emergence of the digital estate "is more likely to mean that [archives] need to educate [their] donors to think of ...digital materials as part of their archive" (p. 42). The researchers note the creation of applications for continuous archiving of life events, though the amount of data archived as a result of these applications may outstrip its accessibility. Thomas and Martin also discuss the vulnerability of personal archives that extend across the multiple roles an individual might play, both public and private. There is concern on the part of the researchers that archivists will miss critical acquisition opportunities, and that organizations like Google or Our Media may become the "de facto archivists of email because they already hold the content on their servers" (p. 44). Leaving aside the issue of Google's legitimacy as a digital preservation organization, it is instructive for cultural heritage professionals to understand how creative artists manage their personal digital collections.

The PARADIGM project team made a conscious decision to work with current records creators (politicians currently in office) because the "vulnerability of digital records, to accidental or deliberate loss, merited a compromise of principles, and that rather than approach politicians at the end of their careers, we had to be working with them from the beginning to ensure that their personal digital archives survived, in accessible form, for us to curate" (p. 38). Although Thomas and Martin debate whether or not the archival profession will approve of intervening earlier in the records management lifecycle in order to ensure long-term preservation, digital curators may be justified in intervening at an earlier stage in the digital film production cycle, perhaps identifying and forming early relationships with active independent filmmakers.

This study utilizes a qualitative approach to data management. Barreau and Nardi (1995, 1997) used qualitative, interview-based data collection methods in their study of computer users' personal information management practices. The two researchers conducted studies independently of one another, and subsequently found that their work contained many similarities. Both researchers wanted to discover how users manage and organize computer desktop files. Barreau interviewed seven managers who primarily used PC systems, while Nardi studied 15 tech-savvy Mac users. The authors conducted tours of their respondents' offices and electronic desktops, analyzed responses for key words and concepts, and looked for general patterns.

The findings that emerge from Barreau and Nardi's studies provide some important baseline concepts for designing a PIM study. For example, Barreau and Nardi found through their observations and interviews that their respondents worked with three core types of information: ephemeral, working, and archived information. These are temporal aspects, since they imply that the value (and placement) of files has in large part to do with what a person is currently working on, needs to access regularly, or can set aside indefinitely.

Barreau and Nardi also found that users retain only small amounts of information in archived form, and that dealing with large amounts of ephemeral information is a major challenge for workers. System design also has an impact on information management. Barreau and Nardi found that Mac users liked to create subdirectories, while PC users did not. Similarly, Barreau and Nardi found some respondents "rarely performed maintenance operations on their directories, preferring to use additional storage media rather than to archive, delete, or compress data no longer used."

Several additional PIM studies use qualitative, descriptive methods. Jones et al. (2005) interviewed 14 men and women, took snapshots of their file systems, and conducted a guided tour of respondents project files and folders. They questioned respondents about their use of folder hierarchies in order to discover how people organize files for specific projects (weddings, school projects, etc.), and discovered that individuals rely heavily on folder names and hierarchies to help them organize projects.

Kaye et al. (2006) conducted visits with 48 academics, including semi-structured interviews and tours of their offices, during which they looked at archived materials, drawers, filing systems, bookshelves, calendars, and other work artifacts. In contrast to the other studies mentioned, Kaye et al. looked specifically at archiving as a practice in and of itself, rather than as an outcome of file management. They explore the concept of the personal archive as a set of interrelated activities, including "selection, organization, collation, display, storage, retrieval, and disposal (p.1)," much like an institutional archive. The study addresses personal archiving as a functional challenge for system design, one that requires consideration of values and intentions in order to meet the needs of users. The underlying goals of personal archiving include a strong current of practicality. People want to be able to find things when they need them, to make their archives reflect their life and work, to share their resources with selected groups of individuals, to prevent their belongings from being irretrievably lost or damaged, and to project their individual identities (as scholars, etc.) to the world.

Kaye et al. found that personal archives were often disorganized. Respondents could locate paper documents much faster than they could locate digital files. Few respondents made backups regularly. Many thought that their digital files could be easily

replaced, but were accustomed to losing files to system crashes or other disasters. This study can be used to frame documentary filmmakers' experiences with the daily maintenance of their digital objects: filmmakers will be asked how often they back up files and about their perceptions of major risks to their digital data.

Metadata is a crucial component of digital preservation, and filmmakers likely have their own, idiosyncratic methods of contextualizing their files. This paper reports on some of the naming conventions and logging practices (i.e. how filmmakers describe individual components of their projects), as well as the types of materials (field notes, research files, transcripts, etc.) that filmmakers maintain for a digital project. Rodden and Wood (2003) followed 13 participants over a six-month period to track their use and management of digital photo management software, and interviewed them about their photo management practices. They found that people created only minimal metadata for their digital photographs, and the frequency with which they access photos decreases over time. Even when the names and locations in photos are fresh in their minds (i.e. right after they are taken), people do not take the time to annotate the individual photos, and rarely go back to do so.

Marshall et al. (2006) examine the challenges that individuals face in their efforts to maintain their personal digital collections, and the implications of those challenges for long-term digital preservation. In an eight-interview pilot study followed by 12 in-depth interviews, they asked respondents to show examples of files on their computers. Interviews were captured on video and audio, and materials were photographed. The authors note, "Our tours through their digital belongings were crucial to understanding and verifying their responses to our questions (p.1)." The study offers recommendations

for designing an effective service for long-term “storage, preservation, and access of digital belongings.”

Marshall and her colleagues found that although people own substantial numbers of digital items, they do not always know how to preserve them; when they do have some knowledge, they do not follow through consistently. Study respondents reported conducting irregular backups, putting files in multiple locations, and keeping older machines in order to preserve the information on them. People did not know what their digital files are worth; their items were widely and unevenly distributed; metadata practices were minimal; the computer systems and software they relied on did not support long-term preservation or access. Likewise, issues such as lack of professional support, problems with malware or spyware, and a general belief that digital objects are fairly stable, all prevented effective personal digital preservation. In addition, respondents reported having difficulties providing adequate metadata, a key issue for sustainable collections. They often had an "air of fatalism" about their digital files, and had already lost significant amounts of valuable information. Even "savvy" users viewed backups as a primary long-term archiving solution. Others thought that simply copying onto new disks or forwarding files to email accounts would be sufficient to prevent loss.

A key finding from Marshall’s interviews is that, despite the fact that personal losses of digital objects are increasing – a situation that poses a significant threat to our digital cultural heritage - the "institutional or disciplinary curatorial best practices do not hold in the home environment (p.6)." This finding makes sense in light of the fact that most people are not trained in either archival or digital preservation methods, and few resources exist for the non-technical user to practice good archiving strategies. The report

also offers several "folk principles" held by respondents with regard to replicating, culling, keeping, losing, and replacing digital files. In summary, respondents:

- choose simple, untested methods for saving files like storing them on email servers
- do not attempt to keep everything
- tend to put off decisions about what to keep or delete
- feel ambivalent about losing digital files
- think they can replace lost items easily

With regard to digital video preservation, there are limited numbers of empirical investigations into personal applications for digital archiving methodologies. Key concepts such as emulation, migration, and refreshing, as well as the requirements for digitization (of analog materials) dominate the literature, and may be useful for classifying and analyzing respondent data. Endeavors such as the Media Matters *Digital Video Preservation Reformatting Project* (2004), the objective of which was to find an optimal preservation format for thousands of Dance Heritage Coalition tapes (mostly stored in VHS format), have recommended that film and video be preserved at the highest possible quality. Compression is an important factor in digital video; in general, there is a trade-off between compression and file quality. In addition, according to the Library of Congress guide to sustainability of digital formats (2007), digital audiovisual preservation is hindered by format obsolescence. Their guidelines note that “no digital format that is inextricably bound to a particular physical carrier is suitable as format for long-term preservation; nor is an implementation of a digital format that constrains use to a particular device or prevents the establishment of backup procedures and disaster

recovery operations expected of a trusted repository."

Much of the current literature on digital audiovisual preservation recommends use of open-source or non-proprietary storage and delivery formats. The UNESCO publication *Towards an Open Source Archival Repository and Preservation System* (Bradley, Lei, and Blackall 2007) considers the importance of open source systems for cultural preservation efforts. It recommends the following core standards for a digital preservation system:

- Create and store the content on a digital file in a format which does not apply any form of manipulation which causes data loss or loss of authenticity.
- Use a format which is widely implemented and supported, and preferably, though not necessarily, open or non-proprietary.
- Use a format that has a potentially long life (digitally speaking).
- Use a format that is most likely to have available migration pathways to the next format.
- Store enough metadata to be able to facilitate identification, access and preservation processes.
- Use a reliable storage format on at least two types of carrier.
- Make multiple copies, and check and verify them regularly.
- Plan to replace carriers and software as the market demands, and plan to migrate the content to the next type of reliable carrier.

A key challenge for preservation of personal digital collections is the proliferation of non-standardized, proprietary, commercial software programs. Commercial software vendors currently do not have a mandate to make their programs' metadata interoperable with that of other programs, and there is little information regarding how the metadata created by video editing software could be mined for archival purposes. In addition, older versions of software programs may not be compatible with newer versions.

Taken in the aggregate, then, the literature reveals a need for further research into how digital preservation requirements relate to the archiving practices of individual

content creators. The archiving and PIM practices of independent documentary filmmakers offer rich possibilities for research, particularly with regard to how the filmmakers' practices affect the prospects for long-term preservation of their work. An analysis of filmmakers' personal archiving practices will include mapping respondents' statements to core concepts like migration, refreshing, emulation, compression, and others related to archival practice.

Few studies have considered individual content creators' attitudes and values with respect to digital preservation. The proposed study will require exploring not only specific filing and archiving strategies, but the creators' attitudes toward the long-term sustainability of their collections as well. Do they want or expect their materials to last beyond their lifetimes? How much time and energy are they willing to invest in order to extend the life of their digital work? How does the ubiquitous nature of hard drive space affect their practices? The lack of research into how artists perceive and manage their digital objects limits the use of pre-existing concepts in this study, but it allows for a clean slate, so to speak, and the potential to add to a body of literature addressing digital preservation's "first line of defense": the creators of our digital cultural heritage.

METHODOLOGY

This paper examines, using a case-study approach, the personal archiving and information management strategies of five independent documentary filmmakers. One of the primary goals of this study will be to discover and describe the practices of individuals in their own work and/or home environments, depending on where they store their video production files.

Many personal information management studies have utilized ethnographic or field observation methods. For this study, semi-structured interviews and field observations provide an opportunity to ask probing questions about specific practices. The intent is to gain a sense of the filmmakers' beliefs, personal experiences, ideas, and practices, all of which involve complexity and nuance. A qualitative, ethnographic approach allows the researcher to follow up on these subtleties and thoroughly explore the reasoning behind participants' behaviors.

The study sample was drawn from regional (central North Carolina), self-identified documentary filmmakers who had completed a documentary film using digital production methods within the five years prior to the study, or were currently working on a digital documentary film project for which they held the primary responsibility for managing the production files. Data collection consisted of in-person interviews with the filmmakers, all of whom who resided at the time in central North Carolina. Brief (.5 hour) initial interviews were conducted by telephone, followed by in-person sessions (1-2 hrs), during which the researcher observed and documented the information management practices of the filmmakers.

Participants were located via a recruiting announcement placed on a local email list distributed to documentary filmmakers and affiliates in central North Carolina (see Appendix for a copy of the recruiting email). It is assumed that these individuals were part of a local documentary filmmaking network that could be tapped for potential study respondents. Recruiting for the study was conducted in early January 2008. No financial inducements for participation were offered. For each participant, this resulted in a total project commitment of approximately 1.5-2.5 hours over the course of one month. Aside

from the initial telephone interview, the location of the interviews was the home or office space(s) designated by the respondents as their video project file management space(s.

The researcher observed file systems, backup and archiving practices, and other organizing strategies of the filmmakers. In addition to recording the specific practices of the participants, the researcher attempted to elicit the reasoning behind the respondents' personal archiving strategies and their attitudes and values with respect to the long-term preservation of their creative work. Extensive field notes were taken to document filing and archiving systems.

As with any research involving direct interaction with participants, there are ethical issues to consider. With qualitative research, a lack of objectivity on the part of the researcher can be a problem. Interpersonal dynamics between researcher and respondent also affect results. In this study, there is the potential for variations in rapport with participants. In addition, qualitative studies utilizing open-ended questions may be inherently difficult to replicate, leading to concerns about reliability. The wording of questions must also be carefully considered in order not to introduce bias. The influence of the investigator may affect the validity of data. Babbie (2007) notes concerns regarding “reactivity” (p. 290), which means that respondents may alter their behavior (for example, clean up their files before the investigator arrives) or change their responses based on what they perceive the researcher expects. The researcher considers herself to be an affiliate of the North Carolina documentary community; this should be acknowledged, as this affiliation has the potential to lead to a biased interpretation of the participants' responses.

An in-depth, qualitative approach provides substantive content for a descriptive

analysis of the selected filmmakers' personal archiving strategies. The results of this study cannot, however, be generalized to all artists working with digital files or even to all documentary filmmakers. Studio-funded filmmakers with substantial digital filmmaking experience (which would be defined as having produced one or more films that have garnered broad, i.e. national or international, distribution) may vary in their practices from those working independently on smaller-scale projects. Industry-sponsored filmmakers and those with substantial, consistent funding would likely have access to greater resources with which to invest in more formal data management systems.

Semi-Structured Interview Questions

The participants were asked a set of broad, semi-structured questions during the interviews and were prompted for any additional thoughts they had or organizational practices they might use with regard to their digital projects.

- How long have you been making documentary films?
- How many films have you completed?
- When was your most recent film completed?
- With whom do you work on your films (editors, sound, videographers, etc)?
- How are your films funded?
- What equipment do you typically use to make a film? Do you own the equipment or lease it?
- Where do you currently store your project files for your films?
- How do you organize your digital film/video project files?
- What file structures do you use?

- How do you name your files?
- How did you decide on this system?
- How satisfied are you with your current filing system?
- Are you able to find materials when you need them?
- Is there a difference between how you organize the files now and how you organized them while you were in production?
- Do other people use your files or have access to them? If so, do they ever make changes to the filing system?
- Describe your backup procedures. Do you back up your files? How often? If so, why do you do this? Where? If not, then why not? What do you perceive to be the biggest risks to your materials?
- If you could determine the length of time that your project files would last, how long would that be?
- Do you think that your project files will be preserved? If so, how long? Where should they be preserved?
- What steps are you taking/ have you taken to provide for long-term care of your materials?
- If an archiving/digital storage service were available to independent filmmakers, would you take advantage of such a service?

RESULTS

Data analysis proceeded from a comprehensive review of participant responses and field notes. Specifically, the researcher examined respondents' personal archiving

strategies within a framework of digital preservation and archival concepts. Analysis involved discovering themes, patterns, similarities, and differences among the respondents' file systems; and describing and identifying statements pertaining to the respondents' attitudes towards preservation and their use of general preservation practices for their digital materials.

Filmmaker profiles

Each of the five respondents was actively engaged at the time of the interview in documentary filmmaking as a primary producer or creator of his or her work, and maintained a designated production office for work and file storage. The filmmakers ranged in experience from a few years to over twenty years of filmmaking, and had produced between four and twenty films either independently or collaboratively. Their films have been funded through personal funds ("sweat equity"), grants, corporate clients (for commercial projects), foundations, and private donations.

The filmmakers owned most of the equipment they used in film projects. Core production equipment included digital cameras, microphones, light kits, hard drives and computer systems (primarily Apple brand), editing software, and computer peripherals such as printers, monitors, and speakers. Four filmmakers maintained a home office; one rented office space in a downtown area. All maintained their storage and archival files in close proximity to their actual workspaces, whether on the same floor or on a separate level of the house, or in a designated closet within the office.

Filmmaker "A"

Year began making films: 2005

Number of films completed: 2

Funding: personal funds

Archive / production office location: rented office space

Software and hardware used: Apple desktop, Final Cut Studio, approximately one terabyte of hard drive and external drive storage space

Filmmaker "A" completed her most recent film in 2007. She primarily works alone, but has collaborated with a composer and an editor for sound and color, and owns most of her production equipment (other than lighting kits). Both of her films are feature-length / long-form documentaries that have been screened regionally and at film festivals.

Unlike the other respondents in the study, she maintains her production files in a formal office setting outside her home; these files are a mix of paper and digital records. Her filmmaking process includes digitizing footage that she has captured on a camera that uses miniDV tapes, a commonly used format in the industry. After watching the footage and making notes about what is most likely to be used in the film, she transfers the footage from the miniDV tape(s) to an external hard drive. The digital editing software can then utilize this footage.

The filmmaker reports only making infrequent backups of her digital files – every six months or so. However, she plans to improve her backup procedures for future film projects. When asked to describe her procedures, she noted that she probably has "too much confidence" in digital media, in part because she has not

experienced any major problems with her materials (failures, etc.) so far. Likewise, she has not given much thought to the long-term preservation of her materials, noting that some libraries and universities hold copies of her films, but that her production files were not likely to be of interest to archives or museums.

Filmmaker "B"

Year began making films: 1997

Number of films completed: about 20

Funding: clients (for commercial work), personal funds

Archive / production office location: home office

Software and hardware used: Apple desktop, Final Cut Pro, mix of external and internal hard drives

Filmmaker "B" has completed one or two film projects per year since she began making films, and finished her most recent film in October 2007. She collaborates with or hires camera operators if she has money in the film budget, but typically handles almost all of the production roles (editing, interviewing, sound) herself, and she owns most of her equipment. For finished projects, she uses an outside company for DVD replication. She has done commercial work funded by clients who have approached her to work on a project for them.

The filmmaker also maintains a mix of paper and digital records. Film project notebooks correspond to the specific camera used to capture the footage; she digitizes only footage that she has reviewed and noted as useful to include in the film. She maintains the digitized footage on her computer's hard drive, and the

project files generated by the editing software reside on an external drive. Her organizational strategies originated in part with film courses she took several years ago.

For backups, she mentioned using "edit decision lists" that indicate where the cuts and edits are in the film and a "media manager" function in the editing program that deletes any media that are not specifically needed for the final cut of the film. Final versions of her films are placed on VHS and/or DVD. She noted that she hoped her film projects would last through her children's lifetimes, but expressed concern about whether her storage and archiving procedures were adequate.

Filmmaker "C"

Year began making films: 1985

Number of films completed: several (not specified) with commercial broadcast companies; one film independently

Funding: commercial work and personal funds, foundation grants

Archive / production office location: home office

Software and hardware used: Apple desktop, Final Cut Pro, mix of external and internal hard drives

Filmmaker "C" has extensive broadcast video experience (18 years) with major television production companies, and has been an independent producer for four years. Her last film was a commercial television project completed in 2001. Although she owns all of her production equipment, she would like to hire crew for

her independent work, but has not had the budget to do so; she typically handles videography, editing, and other production roles on her own.

The filmmaker's extensive broadcast television experience shapes many of her current organizational practices. She maintains both paper and digital files, noting that "hard copies" (paper copies) of files are easier to find and look through. The paper copies of her film logs serve in part as backup for the electronic versions of those files. Her digitization process involves viewing and logging her footage, then digitizing only the clips she intends to edit into the film.

Filmmaker "D"

Year began making films: 1993

Number of films completed: 10

Funding: private donations, grants, broadcasters and distributors

Archive / production office location: home office

Software and hardware used: Apple desktop, Final Cut Pro, mix of external and internal hard drives

Filmmaker "D" has been working on a feature-length film for five years and is close to completing it. He has collaborated with other production staff such as camera crew, editors, and directors of photography. Along with desktop editing software and hardware, he owns extensive production equipment including lighting kits, microphones, and cameras.

The filmmaker maintains paper and electronic files as well as digital tapes (miniDV). Benefiting from inexpensive hard drive space, he chooses to digitize as

much of his camera footage as possible rather than only the clips he plans to use in a film. He uses a paper log of his footage to capture notes about the contents of his tapes, i.e. good clips, notes about specific scenes or interviews, and which tapes should be captured.

After losing several days' work when his hard drive failed, he became more concerned about his backup procedures and began investigating strategies such as mirroring drives. Currently, he considers the original footage (on miniDV tapes) to be the primary backup for his digital media. Electronic project files are saved onto more than one drive in case one of the drives should fail. He notes that long-term preservation of his projects may rely on the multiple copies of his projects he has made onto different media, the film prints stored by the company responsible for making the final print, and a safe deposit box he maintains.

Filmmaker "E"

Year began making films: 2003

Number of films completed: six

Funding: commercial clients, personal funds

Archive / production office location: home office

Software and hardware used: Apple desktop, Final Cut Express/Pro, mix of external and internal hard drives

Filmmaker "E" has completed six short films in five years, with her most recent film completed in summer 2007. Two of the films were promotional documentaries that she made for commercial clients. She both owns and borrows

her production equipment, and has collaborated with film crew on some of her projects (camera crew, editor, and language interpreter).

The filmmaker stores all of her media files (video and audio) on external drives, and her editing files and software on her computer's hard drive. She backs up her project files on compact disk, but clears off her media from the external drives at some point after completing a film project. Final cuts of her film are copied to a miniDV tape. She does not typically digitize all of her film footage, but views and logs her footage first to note what she wants to use in the film. Paper files supplement her digital materials; she maintains model release forms, notes and documentation for projects, field notes, and footage logs in separate binders. She creates specific folders for each film project prior to beginning her production on the film.

Her archival practices include storing her miniDV tapes in boxes, making copies of her completed films, and keeping her files and tapes in a temperature-controlled environment. She indicates that she has investigated more in-depth backup procedures such as mirroring drives. With regard to long-term preservation, she would like to ensure that her projects last at least until technology she uses becomes obsolete. If she continues working in the field for several years and begins to witness her master tapes deteriorating, her interest in using more formal preservation strategies would increase. She has been investigating the possibility of putting more of her work online.

Comparing filmmakers' organizational and archival practices

Interview questions attempted to document the respondents' film production systems, including labeling and general organizational practices. In general, respondents generated and maintained a variety of digital and analog media, including papers, tapes, hard drives, and compact discs. All respondents maintained analog (paper) files in addition to their digital files. File drawers, cardboard boxes, and other shelving were all mentioned:

> **Filmmaker "B":** *My original tapes I keep in a closet that has the least temperature fluctuations in the main part of the house. I have an external drive that has my backup on it; one with old media; and a new generation computer. The systems become obsolete fairly quickly. I have some old 16mm film in the top level of my basement.*
>
> **Filmmaker "A":** *I've been using these [plastic drawers for storage] but at some point they will go into a cardboard box in a storage closet. I keep everything here [at the office].*

Most mentioned some degree of spatial separation between digital and analog files in the office:

> **Filmmaker "A":** *I have a couple of racks of miniDV tapes; I have paper files in a file cabinet, and all my digital files on my computer.*
>
> **Filmmaker "B":** *I keep copies on my computer of the logs, and hard copies in a folder on the shelf, it's a lot quicker to look through hard copy, and also in case the computer goes down. I work from home, I have an office at home, and most things are in one room.*

The most common paper-based production element mentioned was the logging

binder, in which respondents maintained extensive records of the footage contained in their miniDV tapes. Only one respondent typed logging notes exclusively on the computer; most typed then printed "hard copies" (paper copies) for longer-term storage and reference. A typical logging file was a pre-formatted page in which the filmmaker would write notes about dialogue, scenes, time code, and other elements of the footage that might be used or rejected for the final cut. Another respondent described both using physical/spatial techniques as well as logging notes to organize footage contained on miniDV tapes:

> **Filmmaker "D":** *I began with a basic log of the tapes. It has the reel number (the tape number), the date, and a basic description (paper copy). In this I also note problems: for example, there was a problem with digitizing - it had some pixilation. I use the notes to figure out what I want to import. I circle all the tapes I want to import. As I import them, just put an X next to the tape #. And, just to be doubly sure, on the tape rack, when I digitize a tape, I physically move it over to the left [on the miniDV rack], so it's a physical organization scheme as well.*

Only one of the respondents tended to digitize all of his raw footage, while the others logged (viewed while making notes about the footage) their footage and digitized only what they wished to use – a holdover from when digital storage was at a premium:

> **Filmmaker "D":** *When I learned this system in '02, storage space was expensive. Now it's much cheaper, but I still function as though space was scarce, so I don't actually capture all of my footage, I don't digitize everything, because I'm used to thinking that storage space is expensive. Once I know what I want to capture, I make a project file in Final Cut Pro. In the project file is where I digitize my*

footage and capture it all.

More than one respondent discussed keeping project files they created in the editing software program, FinalCut Pro, separate from any media files (video and audio to be used in the film). For editors working in FinalCut Pro, the software generates a project "timeline" which points to specific content in the digitized media. When the project file is read, it calls up the specific content in the media file. In this way, the timeline and the actual digital footage are essentially separate entities. The FinalCut Pro timeline/project files can be stored on the computer or hard drive while the digitized raw material can reside wherever the editor wishes, usually on an external hard drive. In order to save space on their system hard drive, and to ensure that the project timelines – which are the most important files because they comprise the map or script of the film – are preserved, the filmmakers often keep their digitized footage separate from the FinalCut Pro timeline files. The rationale is that footage from the tapes can always be re-digitized, but the timeline, if lost, would have to be recreated from scratch:

> **Filmmaker "D":** *Another reason to keep project files separate from video files is that if you use your external drives as your media drives, at least you have your project file and can recapture everything. You still have all this information that tells you the reel and time code; at least you can recreate it. You have to re-digitize everything, but you can recreate it.*

Labeling and logging practices varied widely. The notes filmmakers made in their paper logs tended to be highly personalized for their needs. Filmmaker "A" noted that she wrote down by hand potentially useful snippets of dialogue from her footage. The filmmakers tended to label their files according to the file's logical meaning within their

film projects. Mini-DV tapes containing raw footage were often labeled with dates and locations, and possibly a control number and the name of the project, but the information captured by the file name or tape label was generally minimal. Digital project files often contain the name of the person being interviewed, or, for b-roll, the location of the shoot. For example, if a filmmaker had shot extensive footage at conferences around the country, each file or tape would be labeled with the location of the conference and the number of the tape in sequence (i.e. #1 of 15). Overall, the underlying structure of the film tended to drive labeling practices:

> **Filmmaker "C":** *I break things down into the elements I need for editing. So if you have a puzzle – what you will have in the end is a completed picture, but that picture comes from a million little pieces, but you have to know what those pieces are or you can't make the picture. Otherwise you have no idea what it's going to look like.*

One respondent noted that the labeling and logging process helped her get to know the footage, so it served a functional purpose beyond helping her stay organized. Likewise, several of the respondents mentioned how important it is to have a clear organizational strategy. One learned a system early on and maintained it:

> **Filmmaker "B":** *From the first courses I took, the instructor was talking about how essential it is to have a system that you stuck to. Mine has evolved as I've gotten more cameras…I've had to refine it more and more just to keep organized*.

Respondents seemed satisfied, in general, with their chosen labeling and organizational strategies, and reported that they were able to find materials when they needed them. One filmmaker acknowledged that she was not sure if her process was the

most efficient or ideal, but that it met her needs:

> **Filmmaker "A":** *At least it is all in one spot so I can get my hands on it. I do have a shelf unit in [the closet] for the [archives]. I have no need to go and find this stuff anymore, so it goes on the shelf and I'll keep it with me.*

Another respondent noted the influence of working in professional production offices:

> **Filmmaker "C":** *It's from years of working in broadcast television, and working in a team, and having to have everything really organized. I've worked in television now for over 20 years, and you have to organize things and file things so that other people can use them.*

The filmmakers reported maintaining fairly consistent organizational practices, in part because committing to an organizational strategy from the beginning made finding and using materials easier throughout the production process and afterward:

> **Filmmaker "B":** *The most important thing in the field is to label your tapes as they come out of the camera, or even before they go into the camera. In the field I would also add the project name or a quick memo about he project I'm working on in addition to the tape number, so that the tape has some info on it about which project it went to.*

> **Filmmaker "E":** *I think it's important to have a very consistent organizing procedure, and start it before production.*

Backup procedures varied from minimal to extensive. All of the respondents placed older materials or items no longer in immediate use (tapes, papers, binders) in storage racks, boxes, or drawers; most cleared their hard drives of any media files they were not

currently using. Media, regularity, and understanding of effective backup strategies were inconsistent, however. Filmmaker "A" did not backup her digital materials regularly – only every six months or so -- but noted that a collaborator, who lived in another state, maintained copies of the same files, so that satisfied her concerns about having backups. Other general materials not sent to her collaborator were transferred to compact discs. Filmmaker "B" made copies of final cuts on VHS tapes, and created an "edit decision list" – a log of specific cuts and sequences comprising the film - that was then copied to a CD. Two respondents reported more complex backup procedures; for example, they used multiple drives to back up files or printed out a "hard copy" (paper copy) of a document as a secondary backup.

> **Filmmaker "C":** *Let's start with my logs. They are on a PC, and I back it up every time I have completed a new tape, finished logging a new tape or completed a new document. I back it up onto a CD. The other way I back it up is as a hard copy, so I have hard copies of everything. I back up my project files onto a CD and in fact I've been putting them onto a flash drive as well as putting it onto a CD.*
>
> **Filmmaker "D":** *The media are backed up on the tapes. They're imported on the drives. The only media backup is the original master – the Final Cut projects. I have the auto save on for every ten minutes, so that saves the project – not the media, just the time codes I've been working with. At the end of a session -- say I've been editing all day -- that session will be saved as yet another backup. I save the project as something different and put it on another drive just in case.*

Attitudes toward risk and preservation

Filmmakers acknowledged several risks to their digital production files. Natural disaster, wear and tear damage to cassettes, system failure, and hard drive or storage media failures were most commonly noted:

> **Filmmaker "E":** *The first thing that comes to mind, because I've seen it happen to other people, is losing data on the computer. The computer dying or the external hard drive dying and that's the scariest thing, because it's so much work.*
>
> **Filmmaker "A":** *I keep everything here [at the office]. Every time there's a tornado warning I have a panic attack, should I have taken everything home with me?*

While filmmakers maintained varying practices for preserving data, all of the respondents expressed some degree of concern that their storage and archiving systems did not meet standards for "ideal" long-term storage:

> **Filmmaker "B":** *I think my system for logging and recording what I have is fairly thorough, but I'm not sure my system for storage is ideal. I feel fine about my filing system. The question I have is about the longevity of the tapes, how often I should rewind them, that I'm keeping them in the best environment for the without renting a facility that is climate controlled.*
>
> **Filmmaker "E":** *Ideally I would copy these on to fresh tapes. This technology changes so much, so quickly, that in ten years we may not even be using miniDV tapes anymore.*
>
> **Filmmaker "C":** *If my computer crashes, I won't lose the whole thing – I've got options. I don't have back ups of my tapes, and I know that if I was in a commercial*

production I would probably see if I could make copies of all my tapes, but I'm not, and it's just the expense and the time, it's more than I can imagine doing.

One respondent acknowledged the challenges posed by changing file and hardware formats:

Filmmaker "D": *The project files will last as long as the physical media last, so as long as I keep periodically copying them to a different type of media. Now, this is just the project, not the media - they were saved on the hard drive - and when I first started, they were on a 3.5 inch floppy. Then I moved to zip drives, and from there to memory sticks, or to smaller drives and then memory sticks. So, as long as the media - the physical media - doesn't degrade.*

Another filmmaker expressed some uncertainty about the sustainability of digital media versus tape-based formats:

Filmmaker "A": *I'd like to think that the digital data has a long life…I know that tapes don't. So I guess that's why I go ahead and digitize things. I wouldn't want to wait more than several months on a tape. But that's the backup – I have the original tapes, so that's my backup system.*

One filmmaker had already formed plans to expand backup and archiving procedures, based on new information she had recently gained:

Filmmaker "E": *I'm exploring the option of having mirroring drives. That's just to be able to back up the media. But that's not a good option, necessarily, because it slows down editing, because the system essentially has to perform the same operation twice. I would have a whole other stack of drives, but I think –not sure – but I would guess it have a companion drive […] so every drive would have a*

companion drive. The computer dying or the external hard drive dying is the scariest thing, because it's so much work. They actually have this mirroring backup system where you have two hard drives, where the computer will write to two drives simultaneously, so you have backups, so I need to investigate that. It may slow things down, but the pay off may be worth it. A filmmaker from New Zealand was working on it: SATA and RAID. Also, the Apple store people know about it..

With regard to long-term preservation, the filmmakers expressed varying opinions as to how long they want their creative work to survive. Filmmaker "D" conceded that technological obsolescence would likely determine her materials' longevity, and that web access to her materials might provide a greater audience if not sustainability:

Filmmaker "D": *Until the technology changes. If I'm saving things on CD-RW or miniDV tapes, I might not have access to them, or if there's a fire. I've also heard of putting stuff online, but I don't know about the safety of that. I think my next step is to get a website going and to have my work available on it, not for safety so much as to have it on there so people can watch it.*

A few respondents expressed ambivalence about the energy required to maintain digital files:

Filmmaker "A": *I've always heard that you have to rewind their tapes, but who has time to do that?*

Filmmaker "C": *Keeping them in different places would be a good thing to do, but I'm not doing that now. If it were a commercial job, I would make an attempt to do that.*

Filmmaker "C" also expressed concern about her lack of knowledge about long-term

preservation:

The material would be great if it was preserved somewhere that has public access. I don't know the best way to preserve digital tapes. I have no idea.

The filmmakers varied in how long they wished their materials to remain available for the indefinite future, and seemed aware of some of the challenges in seeing that goal realized. Some expected their work to remain accessible for the indefinite future, while others were aware of the dangers of technological obsolescence. They reported varying procedures for caring for their materials, including maintaining them in temperature-controlled environments or searching for archival homes for them.

Filmmaker "B": *I'm keeping the original tapes in the place that I think is the best in the house, although I really have several questions about that, what I should do to help their longevity. I recently worked on a project where I had some film from 1932, and I was able to use, so these things can last a long time.*

Filmmaker "C": *I've contacted the libraries and asked if they are interested, and when I'm finished with the project, I will give everything to the library.*

Filmmaker "D": *Once this project is done, I'll have the final film on different types of media – most likely put them in different locations, so one will be in my safety deposit box and then in a closet in my home, and that's a climate-controlled, cool, dry place. This will be on miniDV initial output, but also be in Beta videotape. I'm also going to have a film print made of it.*

Filmmaker "E": *I just haven't thought that far. I keep them out of the sun and keep them dry, have an air-conditioned house.*

Finally, filmmakers were asked if they would take advantage of a digital archiving

service (either commercial or nonprofit) if one were available to them. The cost of such a service was mentioned by all of the respondents as a determining factor. One respondent noted that only an "important" project would warrant such long-term preservation. Most agreed that a data preservation service would be useful.

> **Filmmaker "C":** *It would probably depend on the cost, but I would certainly consider it. It would just be another backup system; fire would not be a consideration. I have one friend who is a photographer who has CDs of his best photographs, he sends one CD to his father, and others to other locations, so he's sure he has multiple copies. I have not done that. Sort of on the theory you can't take it with you! But I also have images – photography – that I would love to make sure they aren't destroyed.*

DISCUSSION

Results can be analyzed with respect to the following general findings:

1. Respondents expressed at least a basic awareness of several digital preservation concepts.
2. Respondents used fragile digital media and engaged in semi-regular backup procedures to protect their creative work.
3. Respondents indicated an interest in gaining assistance with or additional knowledge of how to manage their digital data, including using professional storage services.
4. Respondents were often unclear about actual long-term risks to their materials and about ideal storage conditions for digital materials.

5. Respondents maintained a wide range of complex organizational strategies, documentation, and metadata that may prove challenging to integrate into a formal archival setting.

First, although they varied widely in their individual understanding of specific characteristics of digital media, the case study participants all indicated some degree of awareness of digital preservation concepts such as migration (copying to newer formats), backing up digital files in multiple locations, and refreshing files (copying older tapes to fresh tapes). Some referred to actual experiences of data loss or hard drive failure as the impetus for investing in more secure backup procedures. Their backup and archiving practices varied, but most indicated a desire to protect their data. This increased knowledge separates the respondents in some respects from aforementioned studies of non-expert computer users.

Second, despite awareness of the limitations of doing so, the filmmakers tended to rely on fragile backup media such as compact discs or DVD for longer-term file storage, a finding in line with Marshall's reports on computer users. They relied heavily on software and hardware that were proprietary (commercial) and had already begun to show signs of obsolescence (i.e. VHS tapes for older media, or miniDV tapes that may be replaced by solid state or flash media). Most of the filmmakers acknowledged that the original tapes (what an archivist might refer to as the preservation masters -- for example, the miniDV tapes containing original, irreplaceable footage) eventually deteriorate. Despite these risks, the filmmakers indicated that they did not have a strong motivation (and lacked the time) to migrate their digital files to newer media (for example, copying miniDV tapes to fresh media).

Third, the more filmmakers did mention that they were aware that tapes and hard drives eventually fail, but none indicated that they had investigated professional archiving or remote storage services. This is likely a reflection not of a lack of concern for their digital objects, but lack of funding and awareness of archival resources and convenient data storage solutions. None of the respondents expressed a strong desire to invest in professional data management services. Rather, as was consistent with their filmmaking practices, in which they served as director, producer, and often editors of their films, the filmmakers expressed a strong "DIY" (do it yourself) approach to all aspects of their creative work. They often collaborated with other filmmakers on projects, but took primary responsibility for managing and organizing their project files. It is logical that this independent approach would carry over into their data management and archival practices; nonetheless, as with other elements of the production process, most of the respondents expressed an interest in taking advantage of professional data management services given certain conditions, primarily affordability.

Fourth, in contrast to Marshall's studies of non-expert computer users, a few of the filmmakers (particularly "D" and "E") expressed a higher level of knowledge about maintaining computer software and hardware and the importance of conducting regular backups. However, as a group, their primary concern seemed to be more about keeping *current* project files and media intact while they were working on a film project, as opposed to ensuring long-term preservation of completed projects. Respondents organized their files in such a way as to facilitate their production activities, and tended to maintain the files and folders that were most critical for reconstructing a film should

there be a data loss during production. Once completed, the film's components (tapes and digital files) did not warrant as intensive a protocol for backup or maintenance. During the interviews, filmmakers spoke at greater length about project file organization than about the archiving and preservation of their digital files, and were at times uncertain as to whether or not their preservation strategies were as effective as they could be. There was little mention of specific plans to submit project materials to formal archives or libraries. They reported thinking about long-term preservation, but in general they did not have the resources or the initiative to invest the time and energy necessary to archive their files in a secure, sustainable way on their own.

Finally, formal documentation of the filmmakers' organizational and archival systems was minimal. In other words, while the filmmakers' logging, labeling, and filing conventions were thorough and clear to themselves, it is uncertain as to how the collections might be understood by archivists charged with acquiring and appraising them. If the collections were to find homes in formal archives, thorough project documentation and metadata – including file names, dates, and locations – would likely serve as useful information for the archives' processing of the digital items. Particularly when dealing with large numbers of digital files, of which there may be multiple copies/generations, it is useful to have a clear organization and logical naming/labeling system in order to facilitate appraisal and other archival processing needs.

SUMMARY AND CONCLUSIONS

The independent filmmakers as a group were strongly engaged in data

management, archiving, and preservation activities involving their digital materials. They had a general awareness of basic digital preservation concepts, but often lacked the time and resources to follow through on the best practices for sustaining digital media. They varied widely in their specific backup and data preservation procedures. Most expressed some interest in long-term preservation, but were considerably more focused on managing their current film projects. Reflecting limited financial resources, they indicated varying degrees of interest in obtaining professional assistance with their archiving and digital preservation activities.

This study is intended to spark further inquiry into how archives may benefit from an increased understanding of digital artists' practices – specifically, how they organize, manage, and preserve their production materials. Such information may enable archivists and digital curators to better communicate with donors, set expectations of incoming materials, understand how those materials are organized, and adopt digital asset management systems that reflect the needs of the materials themselves. With a fuller understanding of the filmmaking community's transition to "born-digital" production, knowledge about how digital film products can be more effectively integrated into formal archives.

Further research into 1) how archives manage relationships with active filmmakers and other digital artists, and 2) how archives are managing acquisition and appraisal of digital production files, would provide useful corollary information for information professionals interested in the sustainability of digital multimedia art. Ideally, this research may lead to specialized data storage services for filmmakers and other digital artists, improvements in metadata schema development, enhancements to desktop video

editing systems, and customized ingest tools for archives.

That the filmmakers exhibit a strong commitment to managing their data effectively suggests that relationships between professional digital curators and active digital media artists might be further developed. The concept of the digital estate, for example, might be usefully explored with digital artists, whose members may have a greater interest than the typical computer user in seeing their digital collections preserved over time. If it is possible to intervene in the life cycle of digital media before corruption and data loss occur, more of this digital art may be preserved.

Professional film schools may benefit from offering courses in data management for digital filmmaking. One of the respondents in the study mentioned that she had learned some of her organizational strategies in documentary studies courses. Expanding filmmaking faculty's awareness of digital preservation issues would enable current and future digital artists to understand the requirements for maintaining their digital files.

Archival outreach to filmmakers of interest at the peak of the artists' productivity may enable archives to obtain more thorough documentation for digital film collections and help ensure preservation of the collections before the materials become obsolete or damaged. By creating protocols for early intervention, rather than waiting until the materials come to them, archivists and digital curators can help prevent the loss of valuable cultural heritage materials. The "first line of defense" may be strengthened so that more of our digital creations survive us.

Bibliography

Arts and Humanities Data Service. (2006). Digital moving images and sound archiving study. Retrieved 11/2/2007 from http://www.jisc.ac.uk/whatwedo/programmes/programme_preservation/project_movingimagesound.aspx

Babbie, E. R. (2007). The practice of social research. Belmont, CA: Thomson Wadsworth.

Beagrie, Neil. (2005). Plenty of Room at the Bottom? Personal Digital Libraries and Collections. *D-Lib Magazine, 11* (6). Retrieved 12/1/2007 from http://www.dlib.org/dlib/june05/beagrie/06beagrie.html

Besser, H. (2001). Digital Preservation of Moving Image Material? The Moving Image (Fall 2001). Retrieved 10/13/2007 from http://www.gseis.ucla.edu/~howard/Papers/amia-longevity.html

Bradley, K., Lei, J., & Blackall, C. (2007). Towards an open source archival repository and preservation system: Recommendations on the implementation of an open source digital archival and preservation system and on related software development. Retrieved 12/1/2007 from http://portal.unesco.org/ci/en/files/24700/11824297751towards_open_source_repository.doc

Chen, Su-Shing. "The Paradox of Digital Preservation." *Computer*, March 2001, 24-28. Retrieved 12/1/2007 from http://ieeexplore.ieee.org/

iel5/2/19651/00910890.pdf

Gracy, Karen F., Cloonan, Michele Valerie. (2004). The Preservation of Moving Images. *Advances in Librarianship* 27.

Garrett, J. and Waters, D. (1996). Preserving digital information: Report of the Task Force on Archiving of Digital Information. Retrieved 11/14/20070 from http://www.rlg.org/ArchTF/

Jones, W., Phuwanartnurak, A. J., Gill, R., and Bruce, H. (2005) Don't take my folders away!: organizing personal information to get things done. *Proceedings CHI 2005*, p.1505-1508.

Kaye, J., Vertesi, J., Avery, S., Dafoe, A., David, S., Onaga, L., Rosero, I., and Pinch, T. (2006). To have and to hold: exploring the personal archive. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*.

Lesk, Michael. (1997). How Much Information Is There In the World? Retrieved 12/1/2007 from http://www.lesk.com/mlesk/ksg97/ksg.html

Library of Congress. (2007). Sustainability of digital formats. Retrieved 12/4/2007 from http://www.digitalpreservation.gov/ formats/sustain/sustain.shtml

Marshall, C.C., Bly, S., and Brun-Cottan, F. (2006). The Long Term Fate of Our Personal Digital Belongings: Toward a Service Model for Personal Archives. *Proceedings of IS&T Archiving 2006*.

Media Matters, LLC. (2004). Digital video preservation reformatting project: A Report. Retrieved 11/21/2007 from http://www.danceheritage.org/

preservation/DigitalVideoPreservation1.pdf

Nardi, B., & Barreau, D. (1995). Finding and reminding: File organization from the desktop. *SIGCHI Bulletin, 27*(3). Retrieved 11/21/2007 from http://www.acm.org.libproxy.lib.unc.edu/bulletin/1995.3/barreau.html

Rodden, K., & Wood, K. R. (2003). How do people manage their digital photographs? *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, p. 409-416.

Thomas, S. and Martin, J. (2006). "Using the Papers of Contemporary British Politicians as a Testbed for the Preservation of Digital Personal Archives". *Journal of the Society of Archivists 27* (1).

Wactlar, Howard D., and Christel, Michael G. (2002). Digital Video Archives: Managing Through Metadata. Retrieved 11/21/2007 from http://www.clir.org/pubs/abstract/pub106abst.html

APPENDIX: Study participant recruiting email

Hello,

I am a graduate student at UNC School of Information and Library Science, currently planning a research study on the topic of how independent documentary filmmakers manage their digital files. The results of the study will inform our knowledge of how these materials might be preserved. I would greatly appreciate it if you would forward this notice to any filmmakers you know who may be interested in participating.

For this study, I am looking for independent documentary filmmakers who

1) currently reside in North Carolina,

2) have completed a documentary in a digital format or are currently working on a digital documentary, and

3) would be willing to participate in a) a 1/2 hour initial interview, and b) a 1-2 hour discussion/interview session at the filmmaker's home or office (i.e. the location of their project files).

Interviews will be conducted in early 2008.

About the researcher: Heather L. Barnes is currently a student in the School of Information and Library Science at UNC. I am completing this study in order to fulfill requirements for the Master of Library Science degree.

If you would like to participate, or have questions about the project, please email me at hlbarnes@email.unc.edu, or call me at 919-593-5154, or you may contact my faculty

advisor, Deborah Barreau (barreau@email.unc.edu). This study has been approved by Institutional Review Board at the University of North Carolina at Chapel Hill. If you have questions or concerns about your rights as a research subject you may contact, anonymously if you wish, the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Best regards,

Heather L. Barnes

UNC Chapel Hill School of Information and Library Science